

AMENDMENTS TO THE DRAWINGS

Please replace the original drawing sheet 6/18 including Fig. 6 with the attached replacement drawing sheet including Fig. 6. Fig. 6 on the replacement sheet has been amended to delete reference characters "E" and "F" appearing in the original version of Fig. 6.

Attachment: One (1) Replacement Drawing Sheet

REMARKS

Favorable reconsideration of this application is respectfully requested in view of the following remarks.

The specification has been amended at several places to correct minor informalities. No new matter has been introduced. In addition, submitted with this Amendment is a replacement drawing sheet that includes an amended version of Fig. 6 in which reference characters "E" and "F" have been removed as those reference characters are not referenced in the specification.

Submitted with this Amendment are copies of the four foreign references cited in the Information Disclosure Statement filed on April 15, 2005. These documents were cited in the International Search Report of the corresponding international application. It was expected that copies of these documents would be forwarded by the International Bureau. It appears that may not have been done and appreciation is expressed to Examiner Leung for pointing out this matter. Copies of the four documents are submitted with this Amendment. In the event it is necessary, the Commissioner is authorized to charge any fee that may be required under 37 C.F.R. § 1.17(p) to our Deposit Account No. 02-4800.

The claims at issue in this application include independent Claim 1 directed to a method for manufacturing packages in which a tubular first package part having at least one layer of an induction heatable material possesses a sealed first joint between two mutually opposing edge sections of the sheet. The method involves joining together the first package part and a second package part, with a second joint being formed between the first and second package parts and with the second joint intersecting the first joint. The method also comprises arranging at least two

conductors which extend along each other so that the at least two conductors extend along the second joint. The second joint is sealed by feeding inducing current through the induction heating means along the second joint in opposite directions.

The Official Action sets forth a rejection of independent Claim 1 based on the disclosure in Swedish Application Publication No. 502829 to *Norden Pac* in view of U.S. Patent No. 3,725,630 to *Gagliardi* or U.S. Patent No. 4,340,801 to *Ishibashi et al.*

Norden Pac discloses a method and apparatus for producing a weld in a package by induction welding. The disclosed method involves producing two magnetic fields -- a first magnetic field operating in the area of the weld and a second oppositely directed magnetic field operating in the area outside the weld. A primary coil generates the first magnetic field while a secondary coil generates the second magnetic field. These coils are constructed so that the first magnetic field generated by the primary coil is stronger than the second magnetic field generated by the secondary coil. With the disclosed construction, current is induced in the weld by way of the primary coil, while a weaker oppositely directed current is induced by the secondary coil at a distance spaced from the weld. The purpose of the weaker second magnetic field produced by the secondary coil is to prevent the current of the primary coil from spreading too far outside the weld. The current from the secondary coil is sufficiently large so as to block the current from the primary coil, but is not so large as to damage the package.

Thus, the method disclosed in *Norden Pac* is specifically implemented so that only a part of the induced current is used to perform the induction welding, while the remainder of the current is used to prevent damage to the package. With this

arrangement, the welding efficiency will not be very high since much of the induction heat generated is delivered outside the weld and is thus not used in the actual welding. Further, the disclosed arrangement is relatively complicated because settings and adjustments of, for example, the currents and the mutual spacing of the coils must be performed accurately to achieve an optimum net effect and thus the desired result. Further, the primary and second coils must be constructed to generate inducing currents of different intensities. In order to be able to use just a single current source for this purpose, the coils must be constructed in different ways (e.g., the secondary coil must be constructed to possess more turns than the primary coil).

To more clearly emphasize differences between the method at issue here and the method disclosed in *Norden Pac*, Claim 1 has been amended to recite that the inducing current is conducted along the second joint by one of the conductors in one specific direction and by the other conductor in another specific opposite direction, and to recite that each of the at least two conductors produces a sealed subjoint of the second joint. The subjoints of the second joint produced by each of the at least two conductors is described in the top portion of page 19 of the application. This is not the case with the method disclosed in *Norden Pac* because, as noted above, the first magnetic field produced by the primary coil operates in the area of the weld while the second magnetic field produced by the secondary coil operates outside the weld. Thus, *Norden Pac* lacks disclosure of inducing current being conducted along the second joint by both conductors and does not disclose that a sealed subjoint of the second joint is produced by each one of the at least two conductors.

The claimed method recited in Claim 1 offers a relatively simple, compact and quite efficient construction for sealing. If desired, the conductors can be designed with the same general construction while also being connected to the same current source. Further, seal widths of a relatively significant size can be obtained with the resulting seal composed of at least two sub-joints. As can be readily appreciated, it is important in the context of manufacturing, for example, aseptic packages, that the entire joint be properly sealed. For example, if the joint possesses a width of 5 mm, it is preferable that the seal also possess a width of about 5 mm because germs and the like can get stuck in unsealed parts of the joint. With the method disclosed in *Norden Pac*, it is quite difficult to obtain such a wide seal because the strength of the first magnetic field must be increased to an adequate extent in order to effect proper sealing over such a width. This necessitates a corresponding increase in the strength of the second magnetic field to block leakage of the current. Such an increased second magnetic field causes increased heating outside the weld which means that the risk of damage to the overlapping joint of the package can become quite significant. Thus, the method disclosed in *Norden Pac* is not well suited to the manufacture of aseptic packages or other packages where relatively wide seals may be desired.

In addition, the method at issue here is well suited to use in both internal and external sealing of a large number of different packages. The same sealing possibilities do not exist in the case of the method disclosed in *Norden Pac* because of the nature of the disclosed construction. For example, it would be quite difficult to utilize the method disclosed in *Norden Pac* to carry out internal sealing because both of the coils would not fit in the bottom of the package.

The disclosure in *Gagliardi* does not make up for the deficiencies in *Norden Pac*. *Gagliardi* discloses an induction coil for heating a loop of conductive material. The induction coil 10 includes first and second closed inductive loops 12, 13. As illustrated in Fig. 1, the induction coil is specifically operated so that the direction of the current varies along the inductive loops. The current is conducted through a lead 14 to a connection point 26 with the first conductive loop 12. From here, current is conducted clockwise in one direction from point 26 to point 17 along one part of the inductive loop 12 and is conducted counterclockwise in the opposite direction from point 26 to point 17 along a second part of the inductive loop 12. The current is then conducted through a jumper 16 to a point 18 of the second inductive loop 13. The current is once again divided so as to be conducted counterclockwise in one direction from point 18 to point 27 along one part of the inductive loop 13 and clockwise in the opposite direction from point 18 to point 27 along another part of the inductive loop 13. Thus, the corresponding current induced in the conducting material 11 will be discontinuous in the areas of the connection points 17, 18 and 26, 27. As can be readily appreciated, this will lead to the risk of a weakening of the seal between the cover 23 and the container 21.

In addition, considering the particular construction of the induction coil disclosed in *Gagliardi*, it is difficult to achieve a relatively constant current intensity in the inductive loops. If the jumper 16 is not positioned in exactly the proper place, the resistance of the first parts of the inductive loops will differ from that associated with the second parts of the inductive loops, thus resulting in different current intensities along the inductive loops. The result may be a non-uniform seal between the cover 23 and the container 21.

Ishibashi et al. discloses a continuous heating apparatus used in connection with metal caps. The disclosed apparatus is specifically adapted to seal in a plane and does not have useful application to three-dimensional sealing of a joint between a tubular first package part having a first sealed joint and a second package part, wherein the second sealed joint intersects the first sealed joint. On the other hand, the method at issue here addresses difficulties that arise when performing sealing in an area with two intersecting joints. As discussed in the present application, in this intersection area, an interruption in the induction heatable material exists. The method at issue here helps prevent induced current from leaking to areas outside the joint to be sealed by virtue of this interruption in the induction heatable material. Considering the significantly different nature of the method described in *Ishibashi et al.*, an ordinarily skilled artisan would not have found the disclosure in *Ishibashi et al.* particularly relevant to the method described in *Norden Pac.* Further, the disclosure in *Ishibashi et al.* does not address or make up for the deficiencies pointed out above with respect to the disclosure in *Norden Pac.*

Independent Claim 10 is directed to a device for manufacturing packages comprising means for providing a tubular first package part of a sheet of thermoplastic coated packaging material including at least one layer of an induction heatable material in which the first package part has a sealed first joint between two mutually opposing edge sections of the sheet, means for joining together the first package part and a second package part so that a second joint which intersect the first joint exists between the first and second package parts and current supply means for feeding an inducing current. An induction heating means comprising at least two conductors is also provided for sealing the second joint. Claim 10 has also

been amended to recite that the at least two conductors are constructed and connected to the current supply means such that one of the at least two conductors conducts the inducing current along the second joint in one specific direction and the other one of the at least two conductors conducts the inducing current along the second joint in another specific opposite direction. In addition, Claim 10 has been amended to define that during operation, the package manufacturing device positions the induction heating means to arrange the at least two conductors along the second joint so that each one of the at least two conductors produces a sealed subjoint of the second joint.

Similarly, Claim 11 has been amended to recite that the package manufacturing device operates to position the induction heating means to arrange the at least two conductors along a joint so that when the at least two conductors are connected to the current supply means which supplies inducing current, a first one of the conductors conducts the inducing current in one specific direction to achieve a sealed subjoint of the joint and a second one of the conductors conducts the inducing current in another specific opposite direction to achieve another sealed subjoint of the joint.

Consistent with the discussion above, the device described in *Norden Pac* does not, during operation, position the induction heating means such that the conductors are arranged along the second joint so that each one of the two conductors produces a sealed subjoint of the second joint. Further, the disclosed conductors are not constructed and connected to the current supply means such that both of the conductors conduct the inducing current along the second joint. Similar deficiencies also exist in the other documents relied upon in the Official Action.

It is thus respectfully submitted that the claimed subject matter at issue here as recited in Claims 1, 10 and 11, as well as the dependent claims, is patentably distinguishable over a combination of the disclosures in *Norden Pac*, *Gagliardi* and *Ishibashi et al.* Accordingly, withdrawal of that rejection is earnestly solicited.

Independent Claim 11 and dependent Claim 12 stand rejected under 35 U.S.C. § 102(a) in view of *Gagliardi* and *Ishibashi et al.* To more clearly distinguish over the disclosures in these two documents, Claim 11 has been amended to recite that the conductors are annular conductors and to recite that when the at least two conductors are connected to the current supply means which supplies inducing current one of the conductors conducts the inducing current in one specific direction between opposite ends of the conductor while the other conductor conducts the inducing current in another specific opposite direction between opposite ends of the conductor.

In *Ishibashi et al.*, the conductors are not annular. In addition, considering the context in which the heating apparatus is used, there would have been no reason to employ annular conductors.

In *Gagliardi*, when the conductors are connected to the current supply, current is conducted in one direction from a first point to a second point along one part of each inductive loop and is conducted in the opposite direction from the first point to the second point along another part of the inductive loop. There is thus no disclosure of the inductive loops being constructed such that one of the conductors conducts the inducing current in one specific direction between opposite ends of the

conductor while the other conductor conducts the inducing current in another specific opposite direction between opposite ends of the conductor.

It is thus respectfully submitted that Claim 11 is also allowable over the disclosures in *Gagliardi* and *Ishibashi et al.*

The dependent claims define additional distinguishing aspects of the claimed subject matter at issue here. However, as these dependent claims depend from allowable independent claims, remarks addressing those additional distinguishing aspects are not specifically set forth at this time.

Should any questions arise in connection with this application or should the Examiner believe that a telephone conference with the undersigned would be helpful in resolving any remaining issues pertaining to this application the undersigned respectfully requests that he be contacted at the number indicated below.

Respectfully submitted,

BUCHANAN INGERSOLL PC

Date: May 24, 2006

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